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Integrated results and policy implications

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**INTEGRATED RESULTS
AND POLICY IMPLICATIONS**
BMOI REPORT

BMOI Report

Integrated results and policy implications



Colophon

This report is part of the BMOI project, which stands for ‘Business Models for Open Innovation’. The project aims to generate actionable insights to help firms transform their business model(s) to profit from open innovation. The project applies case-studies and a regional comparison to generate good practices, generic principles, training content and policy recommendations. Other products of the project are: a report describing and explaining differences in openness across sectors and regions and the effect of regional openness on innovative performance, based on data from the Community Innovation Survey; a report identifying challenges of open business models and how to overcome them; and a workshop methodology on open business models.

The BMOI project is part of EURIS, which is supported by the INTERREG IVC programme financed by the European Union’s Regional Development Fund (ERDF), helping the regions of Europe to work together to share experience and good practice in the areas of innovation and the knowledge economy. The three project partners for the BMOI project are: the Public University of Navarra (UPNa), the University of Stuttgart (USTUTT), and Eindhoven University of Technology (TU/e).

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1. Introduction

Nowadays, firms increasingly innovate together with outside parties such as customers, suppliers, research institutes, and complementing agents. While some leading firms in technology intensive sectors, such as Cisco and IBM, are often brought to the forefront as examples of truly open innovators, an increased opening up of the innovation process can be found in a wide variety of sectors and in firms of different sizes. Although earlier writings pointed out that open innovation is more appropriate in industries that are strongly influenced by globalization, technology intensity, technology fusion, disruptive business models, and knowledge leveraging, more recent research has found a trend towards openness across a wide variety of industries [1, 2].

Although innovating with outsiders is not new, several trends have increased attention towards this phenomenon [3-5]:

- Social and economic changes in work patterns (e.g. increasing labour mobility);
- Increased division in labour due to globalization;
- Improved market institutions for trading ideas and technology;
- Increased market dynamics and development rate of technology;
- The rise of new technologies to collaborate across geographical distances.

The term ‘open innovation’ was coined by Henry Chesbrough, in his book of the same title, released in 2003. The basic idea is that firms are better off crossing their boundaries when innovating. An often used definition of open innovation is: “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively.” [6] The concept of open innovation is often contrasted with closed innovation which refers to firms initiating, developing, commercialising, supporting, and financing innovations on their own and not searching for alternative paths to market for technology.

Open innovation can increase a firm’s return on innovation. For instance, research has shown that open innovation may contribute to revenue growth [7], and the proportion of revenues that could be attributed to radical innovations [8].

An important aspect that sets open innovation aside from other approaches is its strong focus on how firms turn their innovation efforts into revenue. Open innovation requires innovations to be aligned with a firm’s business model. As such, Chesbrough [3: xxiv] argues that: “Open innovation combines internal and external ideas into architectures and systems that are defined by a business model.” (emphasis added). However, insights into the use of business models in relation to open innovation are scarce [9, 10].

This report adopts the definition of Osterwalder and Pigneur [11], the developers of the widely used ‘business model canvas’ tool for discussing and developing business models. These authors argue that a business model is a schematic representation of how an organisation creates, delivers, and captures value.

1. Introduction

Open business models have mainly been discussed at the organisational level and not at a policy level. However, when business models become more open to achieve innovation targets, innovation policies must be aligned with this new reality. The ability and necessity of firms practicing open business models is strongly related to a number of external conditions, such as the availability of a substantial stock of basic knowledge, a highly educated and mobile workforce and good access to finance for funding the innovation chain, as well as open and accessible governments [12]. Well targeted policies set out by governments can stimulate external conditions so they co-evolve with the changing nature of innovation management at firm level.

One of the aims of the BMOI project is to provide input for developing or enhancing policies to support open business models. This input is drawn from the findings and conclusions discussed in-depth in two complementary reports:

- BMOI Report: A regional comparison of open innovation practices
- BMOI Report: Towards open business models: some challenges and how to overcome them

The findings and conclusions of these reports are summarised in this report. Subsequently, these summaries are integrated and used to develop recommendations for policy-makers within the collaborative policy areas used by the EURIS programme:

- Networking and collaboration
- Human capital and entrepreneurial culture
- IP management and technology markets
- Access to finance
- Knowledge and S&T (scientific and technological policies) base

As such, the aim of this report can be formulated as follows:

This report specifically focuses on summarising and integrating the findings of the BMOI project and linking them to policy recommendations within the framework of the collaborative policy areas used by the EURIS programme.

This report is structured as follows. The next chapter defines and describes the main concepts used in the project. This is followed by a chapter that discusses the findings of a quantitative study on describing and explaining differences in openness across sectors and regions (Navarra, Stuttgart and Eindhoven) and the effect of regional openness on innovative performance, based on data from the Community Innovation Survey. A subsequent chapter summarises the findings of a case-study, including 10 cases of established firms across the Navarra, Stuttgart and Eindhoven regions. This case-study specifically focused on challenges for the firms when developing and executing open business models, and how firms dealt with these challenges. Then the findings from the two previous chapters are integrated and linked to policy recommendations within the framework of the collaborative policy areas used by the EURIS programme. A final chapter discusses the overall project conclusions and recommendations for further research.

2. Main concepts

The two main concepts used in the project are ‘open innovation’ and ‘business model’. Below we define and further describe these two concepts.

2.1 Open innovation

This study took the following definition of open innovation [6] as its point of origin: “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively”. To make this definition more specific, two main types of open innovation can be identified: inbound and outbound activities (Figure 1).

Inbound activities refer to enriching the firm’s knowledge base through the integration of knowledge, competences, and expertise from external partners such as customers, suppliers, complementing agents, and research institutes when advancing technology. Inbound activities are about knowledge exploration by means of sourcing ideas, expertise, in-licensing, and buying patents. Additionally, they refer to the co-creation of innovation through alliances, collaborations, and joint-ventures.

Outbound activities focus on the commercialisation of technical knowledge. They refer to the external exploitation of internal knowledge by transferring ideas to the outside environment. Outbound activities can be established by, for instance, selling and licensing IP, contract research, and involvement in spin-offs. In this way, organisations can commercialise technologies that are ‘on the shelf’ and include outside parties that may be better equipped to commercialise inventions.

2. Main concepts

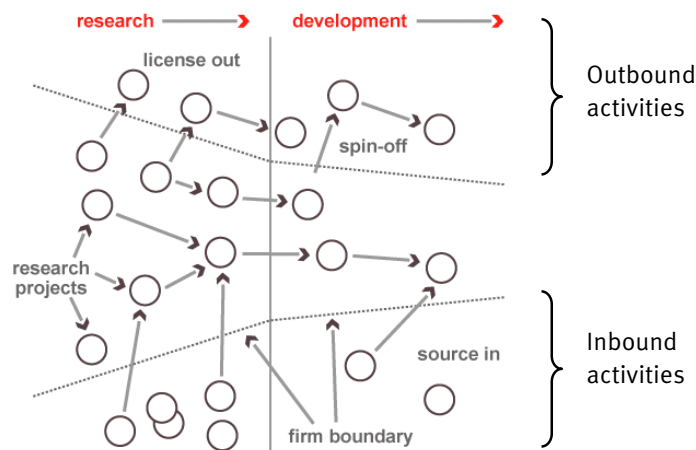


Figure 1: Open Innovation activities (Adapted from [3]).

2.2 Business model

A second important concept is the business model. This study took the following definition, put forward by Osterwalder and Pigneur [11], as its point of origin: [a business model is] a model describing the rationale of how an organisation creates, delivers, and captures value. The business model can be described through nine components that cover the four main areas of business: customers, offer, infrastructure and financial viability (Figure 2):

- Value proposition(s): Describes the bundle of products and services that create value for specific customer segment(s).
- Customer segment(s): Describes for whom the firm creates value and who are the most important customers.
- Channel(s): Describes how a company communicates with and reaches its customers to deliver a value proposition.
- Customer relationship(s): Describes the type of relationship(s) a company establishes with specific customer segments.
- Revenue stream: Represents the cash a company generates from each customer segment and the way it generates this revenue stream.
- Key resources: Describes the most important assets required to make a business model work. They can be physical, financial, intellectual, or human. They can be owned or leased by the company or acquired from key partners.
- Key activities: Describes the most important things a company must do to make its business model work.
- Key partnerships: Describes the network of suppliers and partners that make the business model work.
- Cost structure: Describes all costs incurred to operate a business model.

2. Main concepts

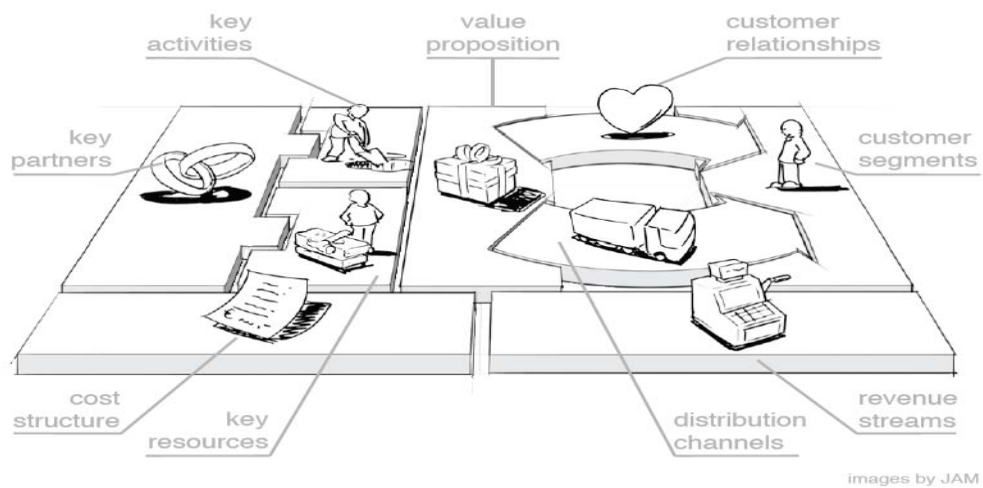


Figure 2: Business models canvas [11].

A business model is essentially viable when all its elements are designed in such a way that revenue outweighs cost.

Below, the conceptualisation is applied to Nestlé's 'Nespresso' business model (Figure 3), which is built around premium coffee machines and coffee capsules (adapted from Osterwalder and Pigneur [11] and <http://businessmodelsinc.wordpress.com/>).

2. Main concepts

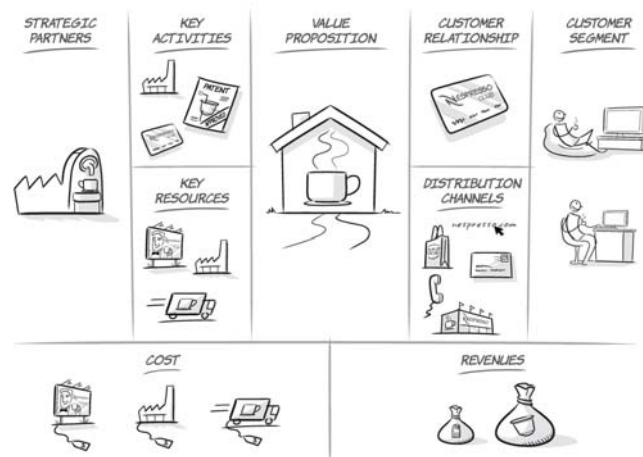


Figure 3: Business models canvas for the Nespresso business model.

- Value proposition: high end restaurant quality espresso at home.
- Customers: households, office market.
- Channel(s): web channel, Nespresso boutiques (store in store).
- Customer relationships: Nespresso club.
- Revenue stream: main revenue by selling capsules, other revenue by selling machines and accessories.
- Key resources: distribution channels, patents on the system, brand, production plants.
- Key activities: marketing, production, logistics.
- Key partnerships: coffee machine manufacturers.
- Cost structure: manufacturing, marketing, distribution, and channels.

3. Regional comparison of open innovation practices

3.1 Study background

The aim of the regional comparison of open innovation practices is to gain a better understanding of inbound open innovation practices, their determinants and consequences in the regions of Eindhoven, Navarra and Stuttgart.

This study makes use of the Community Innovation Survey (CIS) which gathers information about innovation inputs, outputs, goals, hampering factors and performance for innovative and non-innovative firms competing in the manufacturing and service industries.

Due to the structure of the CIS this study specifically focuses on *inbound* open innovation.

3.2 Innovation behaviour

With regard to innovation behaviour within the three regions, the study analysed innovation inputs (i.e. internal and external R&D activities) and innovation outputs (i.e. products, processes, services and patents).

Analysis of the innovation inputs revealed interesting innovative behaviours and differences across the industries:

- For all three regions, internal R&D activities are preferred over external R&D activities. This fact could indicate two key aspects: a) most of the firms are still more closed than open, and b) those firms that practice open innovation activities are aware that internal R&D is a source of knowledge that helps in scanning, evaluating and integrating external knowledge and technology.
- As expected, manufacturing firms more actively develop internal and external R&D than service firms.

3. Regional comparison of open innovation practices

- There are more firms in Stuttgart engaged in R&D activities than in the other two regions.
- Navarra is the region where firms make the largest effort to perform R&D activities, since their R&D intensity is the greatest. Moreover, an unexpected result is that service firms in Navarra have a larger R&D intensity than manufacturing firms. That is to say, for service firms that are active in R&D, these activities are more important than for manufacturing firms.
- Large firms have a greater average R&D intensity in Eindhoven but, in Navarra and Stuttgart, small firms are more dedicated to R&D. One possible explanation for this unusual result is that the concentration of knowledge intensive firms in this industry is very elevated in these regions.

Something that the Eindhoven and Navarra regions should take into account is the efficiency with which the firms are executing the innovation process. Stuttgart seems to have a significant ability to efficiently transform innovation inputs into innovation outputs, as this region has the lowest R&D intensity but the higher rate of innovative firms (see also Figure 4).

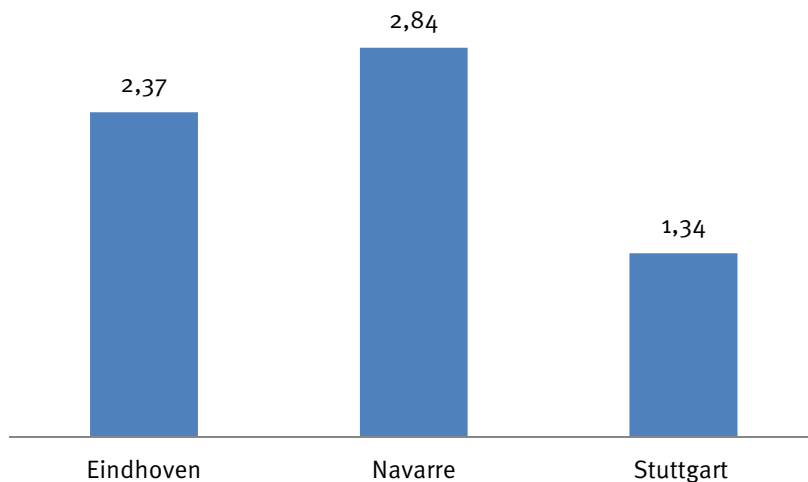


Figure 4: Total R&D intensity for the three regions.

As for innovation outputs, the results indicate that each region has its core competence, as there is a notable tendency to focus on a certain type of innovation output. The Eindhoven region leads in service innovations, Navarra has paid more attention to process innovations and Stuttgart has a clear dominance in the achievement of patents and in the field of product innovations. This aspect is crucial for each region since they might base their competitive advantage in the field in which they have dominion.

3.3 Open innovation practices

In order to measure open innovation practices, the study considered five dimensions: open innovation breadth, which accounts for the number of external sources for innovative ideas; open innovation depth (see figure 5), which measures the importance attached to the external sources of information; open innovation cooperation breadth, which embraces the number of formal collaboration agreements in which the firm is engaged; external R&D expenditure; and external knowledge acquisition, which represents the buying of patents, licences, or inventions. Based on these measures, we have observed that open innovation practices within the three regions are not a sporadic activity. Nevertheless, there are some open innovation types which are less pursued and some industries that remain more closed than others.

3. Regional comparison of open innovation practices

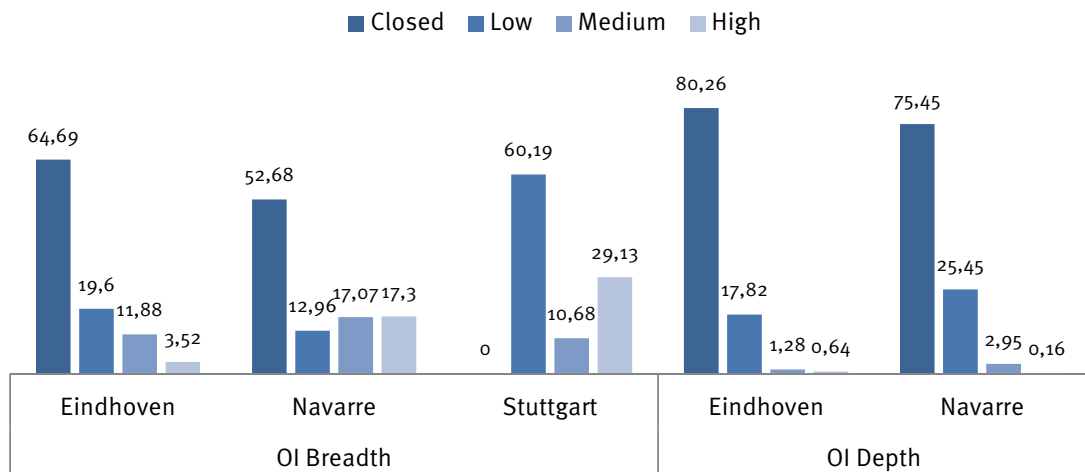


Figure 5: Degree of OI breadth and depth commitment in the three regions (% of firms).¹

When cross-referencing the results of the different types of open innovation activities, interesting concepts can be observed:

- Stuttgart has the greatest level of open innovation breadth and open innovation cooperation breadth. In fact, all Stuttgart firms use at least one external source of information and 80 per cent of firms have formal collaboration agreements.
- Eindhoven is the most closed region in terms of open innovation breadth, depth and external R&D expenditure.
- In all three regions, service firms are more closed than manufacturing firms, in terms of open innovation breadth, depth and cooperation agreements.
- Small firms are more closed than large firms, both in terms of formal and informal open innovation practices.
- Although service firms are more closed in terms of formal collaboration and information sources (breadth and depth), they spend almost double that of manufacturing firms on external R&D.

Point number five may indicate that service firms are less open to looking for external information sources and formally cooperating but that they lead external R&D activities because they are technology users, rather than technology developers.

3.4 Determinants of open innovation adoption

In this study, we were able to analyse the determinants of open innovation activities, and these determinants were grouped into offensive and defensive motives and firms receiving financial funding for R&D from regional or national governments or from the European Union. Offensive motives are those that motivate firms to achieve innovation, such as product, process or environmental objectives. Defensive motives are the barriers perceived by firms when executing innovation activities, such as the high cost of innovation, lack of knowledge, lack of market demand or internal obstacles (Figure 6).

¹ Information on OI depth is not available for Stuttgart.

3. Regional comparison of open innovation practices

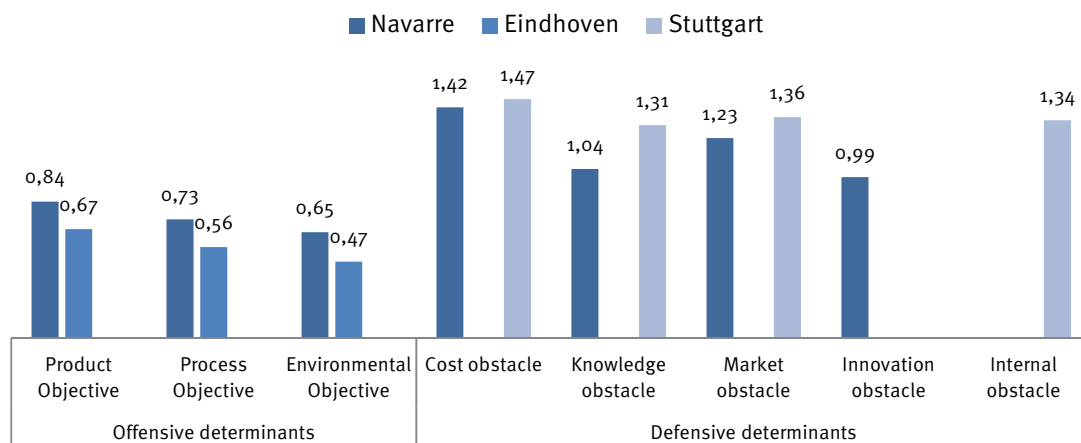


Figure 6: Importance of offensive and defensive determinants for innovation activities.²

Based on the results, we are able to conclude that:

- Governmental funds for R&D activities have a positive impact on firms looking for external sources of information to innovate (breadth and depth) and to establish formal cooperation agreements.
- However, in each region, there is one type of source which has a greater effect; National funding for Eindhoven and Regional and National funding for Navarra ³.

Some other important conclusions that could be drawn from analysis of the offensive and defensive determinants of open innovation practices are:

- The quest for product innovation achievement is the main offensive reason for developing innovation activities in all three regions. This innovation goal stimulates firms to both look for external sources of information and to establish contracts for collaboration agreements.
- There is a positive relationship between innovation objectives and a firm's openness.
- Lack of funding, and the high cost of innovation, is one of the main factors stimulating firms to engage in open innovation practices.
- While Stuttgart firms avoid cooperation with external agents when they experience a lack of knowledge, Navarra firms lacking the same resources, look for formal collaboration agreements.

3.5 Business models and open innovation practices

Open innovation practices modify the way in which firms interact with their customers, suppliers, competitors and other external agents. Therefore, this report analyses the effect that open innovation has on business model innovations. The CIS information allows us to observe innovations in the internal organisation of firms (i.e. organisational innovations) such as revising the way in which a firm organises its workload and applying new methods for establishing external relationships, and innovations in the way in which the firm interacts with customers (i.e. commercial innovations), in short, the 4Ps (product, price, placement and promotion) (Table 1).

² On a scale from 0 (not important) to 3 (highly important).

³ There is no information available for Stuttgart about public funding for R&D.

3. Regional comparison of open innovation practices

Table 1: Percentage of firms achieving different types of business model innovations

Organisational Innovations	Eindhoven	Navarra	Stuttgart
New business practices	20.71	25.13	38.25
Organising work	18.44	24.2	35.86
External relations	12.29	9.23	24.42
Commercial Innovations			
Product design	9.06	10.78	19.29
Promotion	14.84	8.84	23.43
Placement	10.74	5.74	20.91
Price	8.79	6.28	18.58

Based on analysis of the data we are able to conclude that:

- Most of the firms are more focused on organisational innovations than on commercial innovations.
- For Eindhoven and Navarra, there is positive relationship between open innovation practices and the organisational and commercial innovations achieved.
- Stuttgart presented an inverted 'u' shape for the same relationship. That is to say, low levels of open innovation practices positively affect business model innovations, medium levels still have a positive effect but, at the highest level of open innovation, business model innovations are reduced.
- Open innovation breadth and formal collaboration agreements require firms to modify the organisational and commercial part of their business model.

3.6 The effects of open innovation practices on firm innovative performance

A crucial part of this research is to observe whether open innovation practices do increase firm innovative performance and which of these practices is most valuable for achieving high performance. This analysis was essential to discover whether the new trend towards innovation strategy pays off and, also, to determine the direction in which open innovation policy should head. We have selected two variables to measure innovative performance, the percentage of sales due to radical innovations and the percentage of sales due to incremental innovations (PSRI and PRII, respectively), since, rather than just measuring the amount of innovation achieved, they account for the quality of the innovations achieved. These two variables additionally allow us to observe whether one type of open innovation fosters successful radical or incremental innovations⁴.

Based on the analysis, the following conclusions can be drawn with regard to open innovation effects on firm innovative performance.

- For Eindhoven and Navarra, there is a linear relationship between open innovation breadth and open innovation cooperation breadth and the PSRI and PRII; that is to say, the more breadth-open, or cooperation breadth-open, the firm is, the higher the percentage of sales due to radical and incremental innovations.
- Stuttgart registered an inverted 'u' relationship for PSRI, PRII and both open innovation breadth and open innovation cooperation breadth; that is to say, a higher degree of open innovation

⁴ It should be noted that these innovation performance measures might favour those firms that are more prone to obtain product innovations than those that look for process innovations.

3. Regional comparison of open innovation practices

breadth and cooperation breadth could produce negative effects on firm innovative performance.

- Eindhoven and Navarra are able to increase the percentage of sales due to radical innovations based on informal open innovation, but Stuttgart benefits from formal cooperation practices.
- Internal R&D activities and the additional use of internal information sources for innovation is also an important driver, and a complement to open innovation, increasing the percentage of sales due to radical and incremental innovations.
- External R&D only has a positive effect for radical innovation but has no effect for incremental innovation.

4. Case-study on open business models

4.1 Study background

The case-study on developing and executing open business models has specifically focused on the challenges that may arise when developing and executing open business models and how firms have dealt with these challenges.

The main sources for this study are the cases of ten established firms from three European regions (Navarra, Stuttgart and Eindhoven). These data are complemented by academic research on open innovation and business models and documented accounts of a more practical nature on these topics. A characterisation of the cases studied is presented in table 2⁵.

⁵ For a more extensive description of the cases, the reader is referred to Appendix 2 of the BMOI Report: *Towards open business models: some challenges and how to overcome them*.

4. Case-study on open business models

Table 2: Case characteristics

Case (industry)	Characterisation of the business initiative (business model renewal or enhancement)	Type of open innovation
Bosch (Engineering and electronics)	Keeping existing products up to date and so keeping up value creation for existing customers and value capturing potential for Bosch. (business model enhancement)	Inbound: collaboration with research partners to access a variety of new technologies.
MechaniCo (Engineering and electronics) ⁶	Keeping existing products up to date and so keeping up value creation for existing customer and value capturing potential for MechaniCo. (business model enhancement)	Inbound: collaboration with research partners to access a variety of new technologies.
Bodegas Ochoa (Food)	Adding an additional product to its portfolio of gastronomic products (i.e. olive oil) and so creating value for existing distributors and end-consumers and additional value capturing potential for Bodegas Ochoa. (business model enhancement)	Inbound: collaboration with research partner to access knowledge and competences with regard to agricultural growing techniques.
Bruns (Exhibition engineering)	Offering standardised exhibits, as well as custom made exhibits, as a new value proposition for new customers (i.e. smaller museums, shopping centres, and amusement parks). (business model renewal)	Inbound: collaboration with customers of the original business model and a design agency for re-design and promotion
Ingeteam Energy (Power plants- equipment design and development)	Offering standardised components as a new value proposition for new customers (i.e. new entrants to the wind power industry from other geographical areas). (business model renewal)	Inbound: collaboration with universities, technical centres, and prescription engineers to access a variety of technologies and market knowledge.
FEI (Electron microscopes)	Offering a low cost electron microscope as a new value proposition for new customers (i.e. smaller companies and research institutes, and less research intensive educational institutions). (business model renewal)	Inbound: collaboration with mechatronics firm and software firm for several value chain activities.
Kugler-Womako (Printing and paper processing)	Offering a wire mesh machine as a new value proposition for new customers (i.e. tier 1 automotive suppliers). (business model renewal)	Inbound: collaboration with potential customer to access industry knowledge.
Frenos Iruña (Brake systems design and manufacture)	Offering brake systems for wind turbines as a new value proposition for new customers (i.e. wind turbine manufacturers). (business model renewal)	Inbound: collaboration with universities and technical centres for research, new customers for co-creating, and a firm for manufacturing competences.
Philips (Electronics)	Offering research support services as a new value proposition for new customers (i.e. research institutes and technology intensive start-ups). (business model renewal)	Outbound: opening up research support services to other organisations
Van Gansewinkel (Waste management)	Offering technical knowledge with regard to materials and recycling as a new value proposition for new customers (i.e. product developers and designers). (business model renewal)	Outbound: Offering technical knowledge with regard to 'design for recycling' as a consultancy service to other organisations

⁶ MechaniCo is a pseudonym.

4. Case-study on open business models

The case study used the theoretical concepts presented in chapter two as its point of origin. While outbound open innovation was not discussed in the regional comparison based on CIS data, the case study included both inbound and outbound open innovation.

Data analyses resulted in identifying three types of open business model developments: (1) applying inbound open innovation to enhance an existing business model; (2) applying inbound open innovation when establishing a new business model; and (3) applying outbound open innovation as a new business model. These are discussed below in more detail.

4.2 Inbound open innovation to enhance an existing business model

In the cases of Bosch, MechaniCo and Bodegas Ochoa, open innovation was used to enhance an existing business model. In these instances, it was observed that a firm's existing business model was opened up by infusing it with external competences and knowledge to be used for innovation activities. In these cases, an existing business model was adapted by enlarging the 'key partnerships' component. In turn, external resources and knowledge were used to innovate and create and deliver additional value within the boundaries of an existing value proposition and a defined market segment.

With regard to this open business model development, three specific challenges were identified: searching for resources and competences from partners, acquiring them, and assimilating them to create value.

The measures identified that can help support the search for partners with complementary knowledge and competences were:

- Using intermediaries. These intermediaries are open innovation service providers that provide platforms that connect seekers and providers of knowledge and competences and assist in search processes.
- Applying platforms such as 'innovation toolkits' to produce and share knowledge.
- Installing gatekeeper roles and departments which consist of employees with the specific role and processes of strategically thinking with regard to innovation possibilities and finding and screening potential business model partners.

Measures supporting the acquisition of complementary knowledge and competences that resulted from the analyses include:

- Negotiating explicit contracts and licensing agreements.
- Organising means to support knowledge transfer.
- Building confidence with partners.

Finally, the measures identified to support the assimilation of new knowledge and competences into ongoing operations were:

- Adapting incentive systems to decrease 'not invented here' syndrome.
- Discovering additional benefits of the new knowledge and competences and pointing them out.
- Establishing cross-functional interfaces to stimulate connectivity between employees and commitment to the use of knowledge and competences.

4.3 Inbound open innovation when establishing a new business model

In the cases of Bruns, Ingeteam Energy, FEI, Kugler-Womako, and Frenos Iruña, open innovation was used in business model renewal. In these cases, the firms used open innovation to develop a new value proposition targeted at new customers.

4. Case-study on open business models

To implement new value propositions, organisations have to develop new bundles of resources and competences. In developing these bundles, firms often combine individual resources from the business models already in operation with resources and competences that are newly developed, and resources and competences brought in by working with external partners. Firms tapping into resources and competences that are owned by partner firms thus apply inbound open innovation in their business model renewal efforts.

Three specific challenges were identified in relation to this specific open business model development: developing ideas for new business models, establishing and maintaining connections with external partners, and aligning competences.

The measures identified to develop ideas for new business models were:

- Bringing in outsiders that can bring a fresh perspective and are less tightly linked to existing business models.
- Reinforcing open minded attitudes towards new business models through leadership.
- Implementing new business functions and departments that operate somewhat outside the mainstream organisation, allowing existing operations to be combined with developing new business models.

The measures applied to establish and maintain connections with outside partners were:

- Establishing and monitoring competence, strategic and relational fit between the focal firm and the external partners.

Measures to support the alignment of the business model components and achieving internal fit consisted of:

- Mapping the organisational structure.
- Experimenting with new business models.

4.4 Outbound open innovation as a new business model

In the cases of Philips and Van Gansewinkel, the firms developed a new business model around outbound open innovation activities. To develop a business model around technological knowledge as a value proposition, firms had to develop, for example, new customer segments, new distribution channels and new customer relationships. Hence, it required more than mere technology transfer.

The following three specific challenges were identified in relation to this open business model development: de-coupling technological knowledge, developing alternative value propositions, and establishing new customer linkages.

To address the specific challenge of de-coupling technological knowledge, it was identified that firms:

- Used reflection sessions and extensive internal communication to identify technological competences.
- Adapted incentive systems to decrease ‘not sold here’ tendencies.

An important measure applied by firms to develop alternative value propositions was:

- Experimenting with ideas for new value propositions to define the role the firm can play with regard to technology exploitation.

4. Case-study on open business models

Finally, the measures applied by firms to overcome the challenge of establishing new customer linkages were:

- Hiring external technology exploitation experts.
- Implementing sales support by giving technology experts inside the organisation the responsibility to support the traditional sales force when implementing outbound open innovation opportunities.

The following table presents a summary of the findings (Table 3)

Table 3: Summary of challenges and solutions

Type of OI/type of business model change	Challenges	Solutions
Inbound/ Enhancing	Searching for resources and competences	<ul style="list-style-type: none"> • Using intermediaries • Platforms to produce and share knowledge • Gatekeeper roles and departments
Inbound/ Enhancing	Acquiring resources and competences	<ul style="list-style-type: none"> • Negotiating explicit contract and licensing agreements • Organising means to support knowledge transfer • Building confidence with partners
Inbound/ Enhancing	Assimilating resources and competences	<ul style="list-style-type: none"> • Adapting incentive systems • Discovering additional benefits • Establishing cross-functional interfaces
Inbound/ Renewal	Developing ideas for new business models	<ul style="list-style-type: none"> • Bringing in outsiders • Reinforcing open minded attitudes through leadership • Implementing new business functions and departments
Inbound/ Renewal	Establishing and maintaining connections	<ul style="list-style-type: none"> • Establishing and monitoring competence, strategic and relational fit
Inbound/ Renewal	Aligning competences	<ul style="list-style-type: none"> • Mapping the organisational structure • Experimentation
Outbound	De-coupling technological knowledge	<ul style="list-style-type: none"> • Using reflection sessions and extensive internal communication • Adapting incentive systems
Outbound	Developing alternative value propositions	<ul style="list-style-type: none"> • Experimentation
Outbound	Establishing new customer linkages	<ul style="list-style-type: none"> • Hiring external technology exploitation experts • Implementing sales support

4. Case-study on open business models

As well as identifying the challenges and solutions for developing open business models, the analysis focused on the development process for these models. The process of opening up or developing a new business model includes both experimentation and planning. Experimentation is important because adaptations to business models come with high levels of uncertainty and ambiguity. On the other hand, experimentation can only be successful if business models have been screened and uncertainties have been identified in brainstorming and planning sessions. A discovery driven planning approach [13] seems to fit open business model developments. In this planning approach, resources are allocated based on achieving milestones or checkpoints. In this way, resources are gradually released when the expectations of future success rise.

Furthermore, the benefits of applying open innovation in business models were identified. In some cases a discrepancy between the expected and realised benefits was found, in the sense that the expected benefits could not be realised. Conversely, sometimes unexpected and emerging benefits arose that were not anticipated at the outset of developing the open business model.

5. Integration and policy recommendations

To a large extent, the ability of firms to successfully practice open business models depends on the supply and availability of outside knowledge, a highly educated workforce, access to financing opportunities, and legal institutions that protect IP rights. Public policies in regional, national, and trans-national innovation systems have a hand in shaping these conditions.

This report largely focuses on the activities that policy makers can apply to foster the development of open business models. The identification of these policies is based on the integrated findings from the BMOI project, including both the quantitative study on regional open innovation practices and the case-study on open business models. This report follows the categorisation of policies adopted by EURIS:

- Networking and collaboration;
- Human capital and entrepreneurial culture;
- IP management and technology markets;
- Access to finance;
- Knowledge and S&T (scientific and technological policies) base.

Where possible we identify whether a recommendation *supports*, *extends*, or *nuances* existing recommendations already put forward by EURIS (see [14: 15-17] for these recommendations). Additionally, we identify if a recommendation speak to decision-makers in companies, local/regional policy makers and/or national/European policy makers.⁷

5.1 Networking and collaboration

On the one hand, networking and collaboration are essential for developing open business models. On the other hand, competition is also a major driver of innovation. Therefore, in policy making, the right balance should be struck between supporting collaboration and competition. With regard to networking and collaboration, the following recommendations can be presented (Table 4).

⁷ Readers should bear in mind that some of the recommendation are based only on the case-study results.

5. Integration and policy recommendations

Table 4: Policy recommendations with regard to networking and collaboration.

Observation	Eindhoven	Navarra	Stuttgart	Policy recommendation
(a) The more diverse the number of information sources (OI breadth) the more firms are engaged in business model innovation (<i>regional comparison study</i>).	✓	✓	✓	(1) Enhance <i>informal</i> connections and relationships between economic agents on a local, regional, national and international level.
(b) The more diverse the number of information sources (OI breadth) the more firms are engaged in successful radical and incremental product innovation (<i>regional comparison study</i>).	✓	✓		
(c) The potential benefits from OI are the same for large firms and SMEs. (<i>regional comparison study</i>).	✓	✓	✓	
(d) The achievement of formal collaboration contracts with a larger number of partners (OI cooperation breadth) positively influences the realisation of business model innovations and the achievement of successful radical and incremental innovations (<i>regional comparison study</i>).			✓	(2) Foster firm's engagement in <i>formal</i> collaboration activities.
(e) The achievement of formal collaboration contracts with a larger number of partners (OI cooperation breadth) positively influences the realisation of business model innovations and the achievement of successful radical innovations (<i>regional comparison study</i>).		✓		
(f) The achievement of formal collaboration contracts with a larger number of partners (OI cooperation breadth) positively influences the realisation of commercial business model innovations (<i>regional comparison study</i>).	✓			
(g) Downstream networks can facilitate business model innovation (<i>case-study</i>).	✓	✓	✓	(3) As well as upstream networks, regional policy makers should play a part in establishing downstream networks.
(h) Setting up cluster management and innovation agencies followed initiatives from companies and not the other way around (<i>case study</i>).	✓			(4) Policy makers should only invest in establishing cluster management units when this matches initiatives from companies.
(i) Due to 'high costs' as an innovation barrier, firms apply open innovation breadth and cooperation breadth in order to reduce innovation costs (<i>regional comparison study</i>).		✓	✓	(5) As a substitute, or complement, to public funds for innovation activities, governmental agencies should support formal and informal cooperation agreements to lower the cost of innovation activities for firms.

5. Integration and policy recommendations

When moving towards open business models the locus of innovation increasingly moves from companies to networks.

Based on analyses of the CIS data, we concluded that open innovation breadth (i.e. the number of information sources) positively influences both business model innovation as well as product innovation in all three regions. Therefore the first recommendation is:

Recommendation 1: Enhance *informal* connection and relationships between economic agents at a local, regional, national and international level.

With this recommendation, we *support* several Euris recommendations with regard to networking and collaboration, such as ‘building strong networks including smart people, building on excellence and involving strong drivers; developing public-private partnership models with multinational companies’. And ‘supporting intermediaries and platforms for open innovation by setting up open innovation agencies or involving cluster management units and supporting the sharing of facilities.’ Concrete actions could be, for example: organising trade fairs, meetings, and events on central topics or supporting knowledge transfer through virtual platforms, workshops, or printed documents. This recommendation is specifically targeted at local/regional and national/European policy makers.

Additionally, it was found that there are benefits of open innovation breadth for SMEs as well as larger firms. Therefore, we also *support* the Euris recommendation of ‘encouraging and supporting the transnational innovation activities of SMEs. Enabling transnational collaboration in particular between organisations in border regions by synchronising national sources.’ This is an important recommendation because the quantitative analyses showed that SMEs are currently less committed to informal open innovation activities across regions.

Furthermore, it was found that having formal collaboration contracts with a large number of partners (i.e. cooperation breadth) positively influences the realisation of business model innovations and successful incremental and radical innovations in the Stuttgart area, the realisation of organisational business model innovations and the achievement of successful radical innovations in the Navarra area, and the realisation of commercial business model innovations in the Eindhoven area. Therefore:

Recommendation 2: Foster firms’ engagement in *formal* collaboration activities.

Until now, networking and collaboration policies have largely focused on ‘upstream’ activities, addressing exploration and new technical knowledge development in networks between universities, knowledge institutes and companies. Existing policies have paid less attention to downstream networks and value constellations that focus on knowledge exploitation and the commercialisation of new products and technologies [12], and facilitate business model experimentation and ‘living labs’.

The potential of supporting and building downstream networks can be observed in the quantitative analyses, in the specific case of the commercialisation of the small electron microscope by FEI, the implementation of the new consultancy business model by Van Gansewinkel, and developing the new open business model in the case of Frenos Iruña.

In the case of FEI, the regional development agency (BOM) was an active partner in developing the new business model. It initiated network meetings and research on the regional manufacturing industry and facilitated the development of a general roadmap of business opportunities for manufacturing companies in the region. It played a network establishing function and facilitated FEI and its suppliers working together.

5. Integration and policy recommendations

In the case of Van Gansewinkel, it was observed that the implementation of the new consultancy business model was supported by collaborating with municipalities to inform citizens, which increased awareness and acceptance of the new value proposition. For instance, in one initiative, Van Gansewinkel worked together with the municipality of Cranendonck and the firm, Brabantia. The aim of the initiative was to show that by using advanced waste separation techniques 95% of household waste can be re-used as raw materials.

In the case of Frenos Iruña, the Euroinnova Navarra Programme (2008) promoted sectoral and regional cooperation, and the integration within European networks of the agents of the regional innovation system: universities, technology centres, and companies. Frenos Iruña took part in this programme, which gave the firm the opportunity to make its first contacts to enter the wind power business. This new sector was seen as an extremely interesting opportunity and, thus, the firm started a process of implementation of a new business model that involved a high level of openness and collaboration with external agents (including, among others, those who were contacted as a result of participating in the programme). Therefore:

Recommendation 3: As well as upstream networks, regional policy makers should play a part in establishing downstream networks.

Recommendation three *extends* the EURIS recommendation that policy makers should ‘build strong networks including smart people (‘sector champions’), building on excellence and involving strong drivers; develop public-private partnership models with multinational companies’, because it emphasises the importance of both upstream and downstream networks.

Also, cluster management and the establishment of open innovation agencies must follow initiatives from companies and not the other way around. Policy makers should facilitate companies where possible.

In the case of developing the services of MiPlaza, it was observed that the development of the High Tech Campus Eindhoven by the city of Eindhoven *followed* the initiative of Philips to respond to increasing R&D costs and the distribution of relevant knowledge across a wide variety of entities.

In the case of FEI, the regional development agency (BOM) *responded* to the needs of regional suppliers to become more involved in OEM innovation projects and become value added suppliers. Therefore:

Recommendation 4: Policy makers should only invest in establishing cluster management units when this matches initiatives from companies.

This recommendation *nuances* the EURIS recommendation of ‘supporting intermediaries and platforms for open innovation by setting up open innovation agencies or involving cluster management units and supporting the sharing of facilities’. The recommendation is specifically targeted at local/regional and national policy makers in the Netherlands because it is based on case-study findings from the Eindhoven region.

Furthermore, quantitative analyses of the CIS data identified that due to ‘high costs’ representing an innovation barrier, firms apply open innovation breadth and cooperation breadth in order to reduce innovation costs in the Navarra and Stuttgart areas. Therefore:

Recommendation 5: As a substitute, or complement, to public funds for innovation activities, governmental agencies should support formal and informal cooperation agreements to lower the cost of innovation activities for firms.

5. Integration and policy recommendations

By linking networking and collaboration directly to innovation costs we *extend* the EURIS recommendations in this policy area. Recommendation five is specifically targeted at local/regional and national policy makers in Spain and Germany.

5.2 Human capital and entrepreneurial culture

A high quality labour force is one of the prerequisites for open innovation and open business models because it secures the development of new knowledge, the initiation and implementation of ideas and exchange between organisations [3]. Suitable education and training systems at multiple levels can significantly contribute to the development of networking and collaboration skills, corporate entrepreneurship, and the performance of R&D and licensing activities.

With regard to the policy area of ‘human capital and entrepreneurial culture’, the following recommendations can be presented (Table 5):

Table 5: Policy recommendations with regard to human capital and entrepreneurial culture.

Observation	Eindhoven	Navarra	Stuttgart	Policy recommendation
(j) An increase in economic activity may be achieved by looking at open innovation through the lens of a firm's business model and focusing on value creation and appropriation (<i>case-study</i>).	✓	✓	✓	(6) The development of open business models could benefit from raising awareness of this theme through education programmes and ‘life-long learning’ arrangements focused on open innovation.
(k) It was observed that there is a need for technically skilled people to smoothly operate open business models (<i>case-study</i>).	✓			(7) Invest in technical studies.
(l) The use of internal sources for achieving innovations has a highly positive impact on the innovative performance of firms (<i>regional comparison study</i>).	✓	✓		
(m) Foreign companies and workers, and companies and workers from outside the region could be better attracted to the region/cluster when local policy makers are active in making their region an attractive place to work (<i>case-study</i>).	✓			(8) Developing open business models could benefit from regional policy makers making their communities and clusters an attractive place for foreign companies and workers from abroad.

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Recommendation 6: The development of open business models could benefit from raising awareness of this theme through education programmes and ‘life-long learning’ arrangements focused on open innovation.

After studying our cases, we can conclude that an increase in economic activity may be achieved by looking at open innovation through the lens of a firm’s business model and focusing on value creation and appropriation. Several of the firms studied, such as Bruns, Ingeteam, Kugler-Womako, Frenos Iruña, Philips and Van Gansewinkel, renewed several aspects of their business model together with expanding the number of external partnerships or developing value propositions based on technology. For instance, in the case of Bruns, new marketing competences were developed; while, in the case of Kugler-Womako, a new supplier was involved. Hence, a holistic and systematic perspective, such as a business model perspective, is necessary when applying and profiting from open innovation. Therefore, we recommend that, when awareness is raised regarding open innovation in regional, national or European education programmes, this should specifically address open business models.

This recommendation *extends* the EURIS recommendation of ‘modifying or adapting existing curricula at schools and universities in cooperation with companies, taking into account the specific requirements of open innovation and collaboration.’ Recommendation six is specifically targeted at policy makers acting on a national level.

Recommendation 7: Invest in technical studies at all levels as much as possible.

A wide variety of respondents from companies forming part of the case study, such as Bruns and FEI suppliers, emphasised that they were in need of technically skilled people and that these were scarce. Companies not only need technical people for cutting edge research activities, but they also need them to scale up, execute, and maintain manufacturing processes. Only then can open business models be smoothly operated. Additionally, from the quantitative study, we could conclude that internal R&D is the most used strategy to achieve R&D activities and also has a positive impact on both radical and incremental innovations. Therefore, it is recommended that policy makers should invest in the technical skills of human capital as much as possible.

With this recommendation, the total set of EURIS recommendations with regard to ‘human capital and entrepreneurship culture’ is *extended*. This recommendation is specifically targeted at policy makers acting on a national level. Furthermore, recommendation seven is specifically based on data from the Eindhoven en Navarre regions.

Recommendation 8: Developing open business models could benefit from regional policy makers making their communities and clusters an attractive place for foreign companies and workers from abroad.

From both the Van Gansewinkel and the MiPlaza cases, we learned that foreign companies and workers, and companies and workers that operated outside the region, could be better attracted to the region/cluster when local policy makers are active in making their region an attractive place to work. For instance, when upscaling MiPlaza’s activities, its business development team also aimed at attracting foreign companies to settle on the high tech campus. It appeared that when workers of these companies would have access to a wide range of facilities, such as sports clubs, an active cultural sector, and good education in the Eindhoven region, decision-makers were more willing to settle on the campus.

This recommendation *extends* the Euris recommendation of ‘setting up open innovation communities in order to increase awareness of a new “European approach” to open innovation across the world and promote Europe as the preferred place to innovate. For this, existing communities like clusters, etc.

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should be supported to become globally acting open innovation communities.’ Recommendation eight is specifically based on findings from the Eindhoven region.

5.3 IP management and technology markets

Technology markets play a key role in a society with open business models. In technology markets, firms purchase, sell and use technologies developed by other firms to complement their internal technological competences [15]. Therefore, technology markets constitute a critical enabler of open innovation and open business models [6]. Because technology markets are imperfect they involve relatively high transaction costs. A reduction in these costs would probably lead to a greater use of these markets. This has close links to tailoring the IPR regimes and legal systems to a new reality. Within open innovation thinking, intellectual property does not have the sole purpose of preventing others from making use of a protected technology. It also aids collaboration between organisations. Research has found that a well-defined intellectual property protection system can ease knowledge flows [16].

With regard to the policy area of ‘IP management and technology markets’, the following recommendations can be presented (Table 6).

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Table 6: Policy recommendations with regard to IP management and technology markets.

Observation	Eindhoven	Navarra	Stuttgart	Policy recommendation
(n) Investing in external R&D has a positive impact on successful radical innovations (<i>regional comparison study</i>).	✓		✓	(9) Insofar as is possible, companies should foster the acquisition of external R&D and external knowledge in order to increase the achievement of radical innovations.
(o) Navarra region has a low percentage of firms buying external knowledge (<i>regional comparison study</i>).		✓		
(p) It was observed that an internal IP management system was a prerequisite for applying outbound open innovation as a new business model (<i>case-study</i>).	✓			(10) European policy makers should move towards a less complex European-wide patent system.
(q) It was observed that teaching and coaching employees on IP management increases the speed of open business model innovation (<i>case-study</i>).	✓			(11) Developing open business models could benefit from coaching on IP management.

From the quantitative analyses, we found that investing in external R&D has a positive impact on successful radical innovations in the Eindhoven and the Stuttgart regions. Additionally, we found that the Navarra region has a low percentage of firms that buy external knowledge, such as patents or inventions, therefore:

Recommendation 9: Insofar as is possible, companies should foster the acquisition of external R&D and external knowledge in order to increase the achievement of radical innovations.

Additionally, from the MiPlaza case, it emerged that an internal IP management system was a prerequisite for applying outbound open innovation as a new business model. Only after this system was in place, did it become clear what information could be shared. This facilitated discussions with customers. A less complex European-wide patent system would probably increase the speed of developing firm level IP management systems, and so foster open business models. Therefore:

Recommendation 10: European policy makers should move towards a less complex European-wide patent system.

This recommendation specifically *supports* the importance of the EURIS recommendation of improving ‘efficiency by closing procedural loopholes, reducing pendency times and utilising work done by other patent offices.’

In addition, it was observed in the MiPlaza case that teaching and coaching employees on IP management increased the speed of open business model innovation. Awareness and insight into the strategic importance of patents and company rules on sharing information facilitated rapid execution and growth of the new business models around renting out research space and providing research services, because it reduced confusion. Therefore:

Recommendation 11: Developing open business models could benefit from firms paying attention to coaching employees on IP management.

5.4 Access to finance

Innovation activities are often characterised by information asymmetry between innovators and outsiders and uncertain outcomes [17]. Therefore, small firms often find it hard to attract external financing for innovation and the domain of innovation has been larger organisations with slack resources. However, a growing presence of venture capital to support innovation has led to many more individuals and start-ups being able to finance their innovations, leading to more widely distributed innovation activities and an increase in practicing open innovation. Access to finance not only relates to technology projects and research, but is also necessary for other stages, such as venture growth. For each stage, there should be suitable types of funding and different funding partners should be involved [12]. Hence, the availability of external financing is an important condition that enables firms to practice open innovation [3]. As well as supporting the availability of risk capital, public policies may also address access to finance by providing subsidies, guarantees, and matched funding. Such policies can be justified by the argument of market failure.

Hence, the policies focusing on access to finance displayed below are deemed to have a positive impact on practicing open business models (Table 7).

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Table 7: Policy recommendations with regard to access to finance.

Observation	Eindhoven	Navarra	Stuttgart	Policy recommendation
(r) The main hampering factor of open innovation activities was high costs and lack of funding (<i>regional comparison study</i>).		✓	✓	(12) Where possible, continue using innovation subsidies.
(s) Public funds from regional and national institutions enhance open innovation activities (<i>regional comparison study</i>).		✓		
(t) European public funds enhance the use of open innovation depth and cooperation breadth (<i>regional comparison study</i>).		✓		
(u) National public funds enhance the use of open innovation breadth and cooperation breadth (<i>regional comparison study</i>).	✓			
(v) European public funds enhance the use of open innovation breadth (<i>regional comparison study</i>).	✓			
(w) It may take a corporate spin-off to fully commercialise technology (<i>case-study</i>).	✓			(13) Insofar as is possible, support the creation of spin-offs by increasing awareness in larger companies with regard to the availability of risk capital.

From the quantitative study, we concluded that the main hampering factor of open innovation activities was high costs and lack of funding. Additionally, it was found that public funding on a regional, national and European level have a positive impact on developing open innovation activities. Also, in several of our cases (e.g. FEI, Bruns, MechaniCo, Frenos Iruña, Bodegas Ochoa), we observed that using regional, national, and European research and innovation subsidies supported the development of the open business model and resulted in economic activities. For instance, in the case of FEI, a Stimulus grant was used, while in the case of Bodegas Ochoa a grant from the Ministry of Economic Affairs supported the financing of the first olive tree plantation. Therefore, we *extend* the EURIS recommendation of fostering access to risk capital, encouraging business angels and venture capitalists across Europe by putting forward the following recommendation:

Recommendation 12: Where possible, continue using innovation subsidies.

In addition:

Recommendation 13: Insofar as is possible, support the creation of spin-offs by increasing awareness in larger companies with regard to the availability of risk capital.

From the FEI case (Eindhoven region), we learned that it may take a corporate spin-off to fully commercialise technology. At first, development of the open business model took place within firm boundaries. However, it appeared to be difficult to simultaneously operate both the new and traditional business within one company because of strong differences between business characteristics (e.g. low cost focus vs. performance focus). As a result, at a certain time, the new business was spun off. With the importance of corporate spin offs for technology commercialisation in mind, it can be argued that awareness of risk capital and its availability among employees of larger organisations could increase

5. Integration and policy recommendations

insight into the number of potential routes for technology commercialisation and lead to more effective commercialisation decision-making.

Therefore, this study *supports* the EURIS recommendation that awareness and openness should be raised towards risk capital as much as possible. It also *extends* this recommendation by emphasizing that this is not only of importance in the context of SMEs but also in the context of workers from larger companies that want to spin off projects from their home organisation. Recommendation 13 is specifically targeted at local/regional and national/European policy makers.

5.5 Knowledge and S&T (scientific and technological policies) base

Open innovation and open business models benefit from a strong basic knowledge infrastructure. In the past, corporate R&D labs had a large stake in producing fundamental new knowledge. However, in response to shareholder pressure to focus on short term profit, lots of larger companies have shifted significant parts of their investment from basic research to more applied research [3]. Long-term research was increasingly seen as too expensive. Yet, fundamental research is necessary to spur new waves of innovation and develop a rich knowledge landscape. Producing fundamental knowledge has increasingly become the sole domain of universities. Thus, decreasing public funding will have a significant effect on the quality of the overall knowledge infrastructure. As well as public policies assuring appropriate funding to maintain the stock of fundamental knowledge, policies may focus on creating more balance in evaluating and awarding scientists. Currently, they are mainly evaluated on scientific performance, such as publications, which may hamper knowledge valorisation [12]. Also policies may assist the establishment of valorisation resources, such as technology transfer offices. Another aspect is reducing the extent to which the approach is scattered and fragmented, and improving focus on excellence when distributing research funds, including both scientific performance and valorisation efforts. Universities should only work together if they have complementary competences and not because it is required by funding programmes [12].

With regard to knowledge and S&T policies, the following recommendations can be presented (Table 8).

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Table 8: Policy recommendation with regard to access to finance.

Observation	Eindhoven	Navarra	Stuttgart	Policy recommendation
(x) Each region has a focus area (<i>regional comparison study</i>).	✓	✓	✓	(14) Reinforce existing capabilities.
(y) Developments in a certain field attract other developments in that similar field (<i>case study</i>).	✓	✓		

Recommendation 14: Reinforce existing capabilities where possible.

From the quantitative study, it was concluded that each region has a focus area. Eindhoven leads in service innovations, Navarra has a particular focus on process innovation, and Stuttgart is the leader in terms of patent achievements and product innovations.

Additionally, from the MiPlaza case, we learned that world-class players in a certain technical field attract world class players in that similar field. In the case of Ingeteam Energy, it was observed that the development of the open business model with regard to selling standardised components for the wind-power industry was supported by regional policy makers financially backing the wind power industry. Indeed, institutions in Spain aimed to foster the development of this industry and guarantee an energy generation system able to lessen dependence on fossil fuels (the main support mechanism for renewable energies has been based on the bonus system). Additionally, Navarra was one the first regions in Spain to design a Renewable Energy Promotion Plan (Plan de Fomento de las Energías Renovables 1995-2000, within the framework of the Plan Energético de Navarra 1995-2000). This Plan had very ambitious objectives and, as a result, the wind power industry experienced an intense development. However, the incentives to foster renewable energies have decreased gradually over the last few years. Thus, promotion of the wind power energy business in Spain was essential at the beginning of the industry, but has nowadays faded considerably.

Based on these findings, we recommend that regions should reinforce what they are already good at and, where possible, create world-class centres of industry. Hence, we *support* the recommendation made by the EURIS programme on ‘concentrating more on world class poles and strive for excellence in order to ensure visibility and foster technology transfer.’ This last recommendation is specifically targeted at regional policy makers.

6. Conclusion

This chapter presents the overall conclusion of the BMOI project. The BMOI project started by highlighting that an important aspect in establishing open innovation, aside from other approaches, is its strong focus on how firms turn their innovation efforts into revenue and that open innovation should be aligned with a firm's business model. However, it also highlighted that the use of the open innovation concept in relation to business models is scarce. The overall aim of the BMOI project is to generate actionable insights to help established firms to transform their business models to profit from open innovation. Important resources for the achievement of this objective are a comparative study of open innovation practices in the Eindhoven, Navarra, and Stuttgart regions and a set of cases of how firms implemented open business models.

The regional comparison of open innovation practices showed that, in most cases, there is a positive relationship between open innovation practices and the organisational and commercial innovations achieved, and that applying open innovation arrangements requires firms to additionally modify the organisational and commercial parts of their business model. Furthermore, the cases highlighted that applying open innovation often goes hand in hand with implementing new business models, resulting in unique challenges for both firms and policy makers.

In addition to reports including advice and recommendations for businesses and policy-makers, the BMOI project has taken an additional step in disseminating results by developing an interactive workshop targeted at a business audience and business advisors.

Although, it was found that open innovation and business models should be considered in combination, additional research is necessary. For instance, the qualitative part of the project, which resulted in identifying challenges and ways to overcome them, was based on ten cases. Additional research may further validate these findings. Furthermore, in the quantitative part of the project, in which CIS data was used, it was not possible to investigate to what extent firm performance was influenced by simultaneously combining open innovation and business model innovation. Are firms that simultaneously invest in both types of innovation performing better than firms that focus solely on one type? Further research may look into this and enhance our knowledge base on open innovation.

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